

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report Proposed Amendment Rule 463 – Organic Liquid Storage

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EXECUTIVE SUMMARY

Background

South Coast Air Quality Management District (AQMD) Rule 463 – Organic Liquid Storage, controls Volatile Organic Compound (VOC) emissions from above-ground stationary tanks used for storage of organic liquids. The proposed rule amendments address the hydrogen sulfide (H_2S) concentration standard in crude oil and the methods for determining compliance with organic liquid vapor pressure. A hydrogen sulfide concentration limit in crude oil was added to the rule in 1984 to ensure that hydrogen sulfide emissions from the storage of crude oil would not cause an exceedance of the state ambient air standard, 0.03 ppm, ($42 \mu\text{g}/\text{m}^3$ -one hour standard). The test method for determining the hydrogen sulfide content in the crude was added in 1994, to address the Environmental Protection Agency's (EPA) limited disapproval of a rule with a standard without a corresponding test method to verify compliance with that rule standard. The District is unclassified regarding attainment for hydrogen sulfide which indicates a lack of, or insufficient, air data for determining attainment status. Both sulfur dioxide and sulfates are measured regularly at various air monitoring stations in the Basin. The measured data shows that ambient air concentrations of sulfates and sulfur dioxide in 2001, 2002, and 2003 were at least 20 percent and 60 percent below the state ambient air quality standards, respectively.

Rule 463 also includes an addendum specifying the correlation between storage temperature and the actual vapor pressure for various organic compounds. However, there is no corresponding rule language specifying how the information in the addendum should be implemented. In reviewing past rule amendment administrative records, it was found that the corresponding rule language was deleted in error when the rule was amended in March 1994.

Proposal

Staff proposes to remove the hydrogen sulfide standard and the associated test method, and add language related to compliance determination of the vapor pressure limits for various organic compounds. The proposal is based on the following information. EPA's *Guidelines for Including State & Local Rules in SIPs*, December 17, 1998, states that regulations developed to control non-criteria pollutants, such as hydrogen sulfide, are inappropriate for inclusion in State Implementation Plans (SIPs). Staff has determined the test method specified in the rule, SCAQMD Test Method 315-91, is not reliable and is inappropriate for determining H_2S concentrations in crude oil. No other reliable test method has been identified at this time. Furthermore, staff conducted testing in 1999, at local refineries and bulk loading terminals, to determine whether sulfur compounds determined as hydrogen sulfide pursuant to the method specified in the rule, would remain in the liquid product or evaporate as gaseous sulfur into the vapor space at the top of the tanks. Only one of eleven samples detected hydrogen sulfide in the vapor space between the primary and secondary seals, and the level detected was just 1.7 ppm. The results of the study clearly show that the hydrogen sulfide remains in the crude oil under storage conditions and does not off-gas.

Also, in an effort to improve rule language consistency, the definition of EXEMPT COMPOUND is modified to refer to Rule 102 – Definition of Terms, as in other District rules. Furthermore, language has been added to the Test Method section reflecting the generic

statement allowing for the use of alternative test methods that have been fully approved by the regulatory agencies overseeing test method development. This is standard language in many of the source-specific rules. In addition, the language inadvertently deleted from the rule in 1994 amendments pertaining to vapor pressure testing has been restored to the definitions, requirements, and test methods sections.

CHAPTER 1

BACKGROUND

REGULATORY HISTORY

BACKGROUND

REGULATORY HISTORY

AQMD Rule 463 was adopted August 1977 and subsequently amended three times. The 1984 amendments added a criterion for hydrogen sulfide content in crude oil contained in floating roof tanks. The standard was based on a modeling study and enacted to address potential odor nuisance concerns from a now defunct refinery. A review of the rules of all 35 air pollution agencies in California, revealed that only Antelope Valley Air Quality Management District has a standard for hydrogen sulfide content in crude oil and that is because in 1997, they subsumed the AQMD rules. Antelope Valley Air Basin does not have any crude oil storage units. Since the mid-1980's, the AQMD has not logged any odor complaints for floating roof tanks. Furthermore, the federal standards under 40 CFR, Part 60 NSPS Subparts K, Ka, and Kb covering storage of petroleum liquids do not include any standards for hydrogen sulfide.

The last amendments to Rule 463 were made March 1994. That amendment restructured the rule, clarified rule language, streamlined compliance activities, and corrected rule deficiencies identified by the EPA and California Air Resources Board (CARB). Several deficiencies corrected pertained to references to, and lack of, specific test methods. SCAQMD Method 315 – 91 (Determination of Hydrogen Sulfide and Mercaptan in Oil and Sludge Samples) was added to determine compliance with the hydrogen sulfide concentration limit specified in paragraph (d)(4). The test method, SCAQMD Test Method 315 - 91, has since been determined to be unreliable and inaccurate for this purpose. Staff conducted testing in 1999, at local refineries and bulk loading terminals, to determine whether sulfur compounds determined as hydrogen sulfide pursuant to the method specified in the rule, would remain in the liquid product or off-gas into the vapor space at the top of the tanks. The results from this study showed that sulfur compounds remain in crude oil under storage conditions. Only one out of eleven samples detected hydrogen sulfide in the vapor space between the primary and secondary seals and this was at a concentration of just 1.7 ppm. This indicates that the hydrogen sulfide does not off-gas from the crude oil.

In addition, it has become apparent that SCAQMD Method 315 - 91 is not accurate enough to determine rule compliance with the 70 ppm standard, nor can the results of analyses conducted with this test method be reproduced. AQMD sent seven duplicate samples of crude oil to two different laboratories for SCAQMD Method 315 - 91 analysis. The resulting values ranged from 1 to 40 ppm hydrogen sulfide. Statistical analysis of the data shows the results can only be repeated to within plus or minus 20 ppm 99% of the time, a range larger than that acceptable to determine compliance at the 70 ppm level. Investigation by outside laboratories and the industry have failed to produce an alternative test method for measuring the hydrogen sulfide in crude oil.

Additionally, Rule 463 also contained a requirement for operators with tanks subject to Rule 463 to keep an accurate record of liquids stored in the tanks and the true vapor pressure of liquids. Although this was part of the language inadvertently deleted, recordkeeping has still been required through the language requiring compliance with Attachment C – Data Reporting for Roof Tanks. The deleted language also contained a provision that unless a person measures vapor pressure by a method acceptable to the Executive Officer, all vapor pressure compliance

testing shall be by unmodified Reid method and the true vapor pressure in psi absolute of stored liquid shall be determined by using the nomographs contained in American Petroleum Institute conversion of Reid vapor pressure to true vapor pressure. Test method language has been restored under subdivision (g) Test Methods. Furthermore, previous rule requirements also contained an enforcement provision that deemed certain organic liquids to be in compliance with the appropriate vapor pressure limits provided that the storage temperature does not exceed the corresponding maximum temperature limit listed in the addendum contained in the rule. In the current version of Rule 463, this addendum is included in the rule without corresponding rule language linking the requirements of the rule to the addendum. In reviewing the staff report for the March 11, 1994 amendment, staff found that in the earlier version of the proposed amendment, AQMD staff proposed to change the rule applicability criteria from a vapor pressure limit to VOC concentration. As a result, AQMD staff substituted vapor pressure references with VOC concentration references. This included a proposal to delete paragraph (b)(4) of Rule 463 and its corresponding addendum. Based on the comments received from EPA and industry, AQMD staff decided to revert back to use vapor pressure as the rule applicability criteria instead of the VOC concentration limit. In its response to EPA's comment, the District indicated that "The existing rule addendum correlating actual vapor pressures with storage temperatures for some organic liquids is being restored." However, staff inadvertently failed to restore the corresponding rule language that was critical to the enforcement of vapor pressure requirements for various organic compounds under various storage conditions and temperature. The language linking the rule and the addendum has been restored in this proposal.

CHAPTER 2

PROPOSED AMENDMENTS

GENERAL DESCRIPTION AND EXPLANATION OF THE PROPOSED AMENDMENTS TO RULE 463

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GENERAL DESCRIPTION AND EXPLANATION OF THE PROPOSED AMENDMENTS TO RULE 463

APPLICABILITY

Rule 463 applies to any above-ground stationary tank with a capacity of 75,000 liters or greater used for the storage of organic liquids, and any above-ground tanks with a capacity of between 950 liters and 75,000 liters used for storage of gasoline.

DEFINITIONS

The definition of “Exempt Compounds” is established by the federal government with periodic updates to the list of compounds considered to be exempt from VOC regulations and emission calculations because they are determined to be non-photochemically reactive and therefore do not act as an ozone precursor. AQMD’s practice has been to reference Rule 102 – Definitions, in all VOC rules thus, requiring that only one rule be amended as the federal definition is periodically changed to reflect the newest science. Following this practice, staff proposes to remove the specific language defining “Exempt Compound” from Rule 463 and reference Rule 102 for the definition “Exempt Compounds”. Additionally, a new definition was added for “Heavy Crude Oil” that is associated with a test method for true vapor pressure.

REQUIREMENTS

Staff proposes to remove the hydrogen sulfide concentration standard for crude oil stored in a floating roof tank in paragraph (d)(4). The criterion for hydrogen sulfide content in crude oil was added in 1984. According to the 1984 staff report, this was based on a modeling study that showed potential violation of state ambient standards if the criterion was exceeded. The report states “These limits have been developed from a modeling study which determined that, at the proposed threshold H₂S limits, adjacent ground level concentrations would not exceed ambient air quality standards.” However, actual testing conducted by the AQMD in 1999 at local refineries found no evidence of hydrogen sulfide near or around the crude oil tanks indicating that the hydrogen sulfide does not off-gas from the crude oil. Furthermore, since adoption in 1984, the AQMD has not received any odor complaints for crude oil tanks and the refinery of concern for potential odor complaints is no longer in operation.

The test method added in 1994 to Rule 463 paragraph (g)(5) has proven to be inaccurate for this purpose and compliance with the standard cannot be determined. Investigation into alternative test methods by outside laboratories and the affected industry has failed to result in identification of an alternative test method to measure the hydrogen sulfide content. Staff proposes to remove the standard and the associated test method, SCAQMD Method 315 -91, from the rule.

The current rule states Reid vapor pressure is used in determining true vapor pressure. Since the corresponding rule language was inadvertently deleted in the 1994 rule amendment, staff proposes to restore the original language that was intended to enforce rule applicability for various organic compounds through the use of the information in the addendum. Language has also been restored for the test methods associated with true vapor pressure.

Additionally, a reference in subparagraph (f)(1)(A) (exemptions) was corrected to subdivision (c) instead of paragraph (b). Further clarifications include adding language to the beginning of the Test Methods section regarding the use of alternative test methods that have been approved by AQMD, CARB and EPA. In conjunction with this addition, the older language alluding to this practice in paragraph (g)(6) has been removed. The word “Reference” was added to EPA test method names and the word “Test” deleted when referring to SCAQMD methods to reflect the actual method nomenclatures. Further clarifying changes are made to the Rule 463 Compliance Report form found as an attachment to the rule. The address and fax number for the AQMD was updated to reflect current information and symbols in the legend section were added that had been missing.

CHAPTER 3

IMPACT ASSESSMENT

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IMPACT ASSESSMENT

INTRODUCTION

This chapter discusses the impact assessments for the proposed amendments to Rule 463 – Organic Liquid Storage.

ENVIRONMENTAL IMPACT ASSESSMENT

Pursuant to the California Environmental Quality Act (CEQA) and AQMD Rule 110, the AQMD will be preparing the appropriate CEQA document to analyze any potential adverse environmental impacts associated with proposed amendments to Rule 463. Comments and suggestions regarding environmental impacts from proposed amendments to Rule 463 should be directed to James Koizumi at (909) 396-3234.

SOCIOECONOMIC ASSESSMENT

There is no Socioeconomic Assessment of the proposed amendments to Rule 463 as the removal of the standard and test method and the administrative changes will not result in any socioeconomic impact to the affected sources.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Requirements to Make Findings

California Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the AQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report.

Necessity

A need exists to amend current Rule 463 to accomplish the following:

- Remove a standard that is not enforceable;
- Restore language erroneously deleted in prior rule amendment;
- Provide rule consistency; and
- Correct test method procedures to reflect accurate measurements.

Authority

The AQMD Governing Board has authority to amend existing Rule 463 pursuant to the California Health and Safety Code Sections 39002, 40000, 40702, and 40725 through 40728.

Clarity

Proposed Amended Rule 463 is written or displayed so that its meaning can be easily understood by the persons directly affected by it.

Consistency

Proposed Amended Rule 463 is in harmony with and not in conflict with or contradictory to existing statutes, court decisions or state or federal regulations.

Non-duplication

Proposed Amended Rule 463 will not impose the same requirements as any existing state or federal regulations. The amendments are necessary and proper to execute the powers and duties granted to, and imposed upon, AQMD.

Reference

By adopting Proposed Amended Rule 463, the AQMD Governing Board will be implementing, interpreting or making specific the provisions of the California Health and Safety Code Sections 39002 (Local and State Agency Responsibilities), 40000 (Local/State Responsibilities), 40702 (Adoption of Rules and Regulations), and 40725 through 40728 (Public Hearing Requirement; Provision of Submission of Comments; Findings of Necessity, Authority, Clarity, etc.; District Preparation of Written Analysis; Contents of Rulemaking Records).

COMPARATIVE ANALYSIS PURSUANT TO HEALTH AND SAFETY CODE SECTION 40727.2

Health and Safety Code section 40727.2 requires a comparative analysis. This analysis has not been performed by, in accordance with Health and Safety Code section 40727.2 (g), making a finding that the proposed amendments do not impose a new emission limit or standard, nor make an existing emission limit or standard more stringent, nor impose new or more stringent monitoring, reporting, or recordkeeping requirements.

AQMP AND LEGAL MANDATES

The Air Pollution Control Permit Streamlining Act of 1992 (Article 1.5 of Chapter 4 of the Health and Safety Code), requires air pollution control districts to “institute new,

efficient procedures which will assist businesses in complying with regional, state, and federal air quality laws in an expedited fashion, without reducing protection of public health and the environment.” Proposed Amended Rule 463 has no air quality impact and the amendments add clarity and consistency with other District rules.

RULE ADOPTION RELATIVE TO COST-EFFECTIVENESS

Proposed Amended Rule 463 is not a control measure in the 2003 Air Quality Management Plan (AQMP) and thus, was not ranked by cost-effectiveness relative to other AQMP control measures in the AQMP. Cost-effectiveness in terms of dollars per ton of pollutant reduced is not applicable to the proposed rule amendments, since they are administrative in nature and have no impact on air quality.

INCREMENTAL COST-EFFECTIVENESS

Health and Safety Code Section 40920.6 requires an incremental cost-effectiveness analysis when there is more than one control option which would achieve the emission reduction objective of the proposed amendments, relative to ozone, CO, SO_x, NO_x and their precursors. Since the proposed amendments to Rule 463 apply to a non-criteria air contaminant, hydrogen sulfide, the incremental cost-effectiveness analysis requirement does not apply.